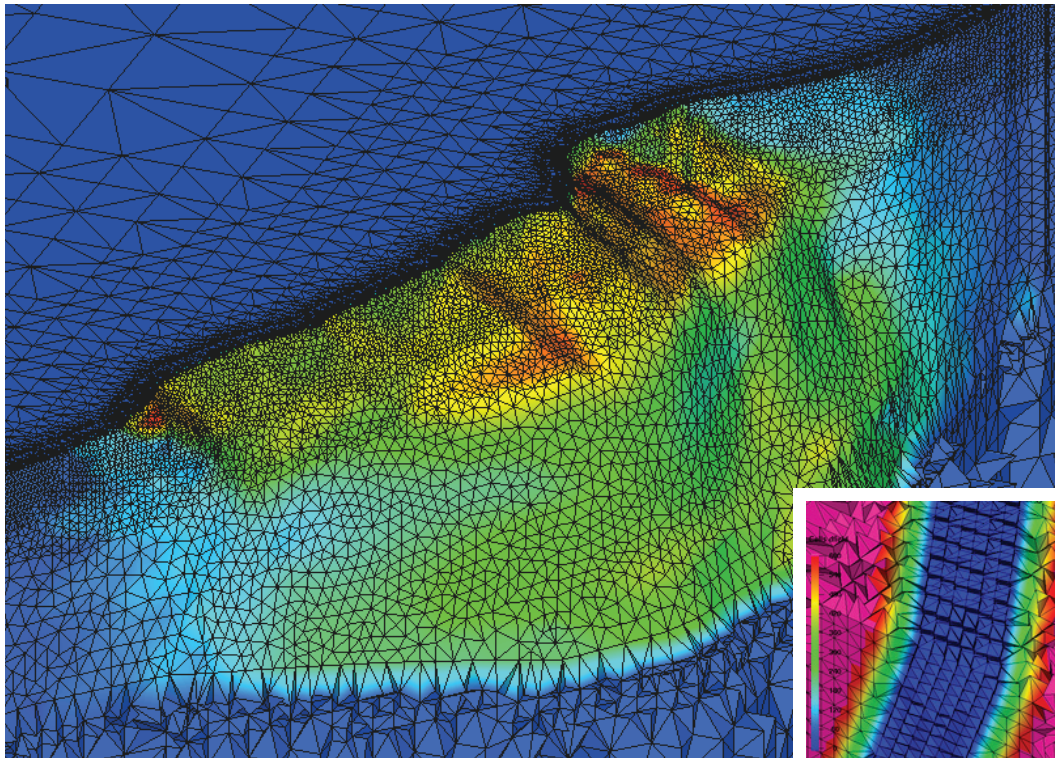


# LaGriT: Los Alamos Grid Toolbox

## Meshing for geological applications



How do you model complex environmental systems? The key is generating an accurate grid (or mesh)—the link between geoscience information and numerical models—which insures that the computations produce accurate and stable results.



**Left:** San Andreas fault finite element mesh. Color indicates fault dip: red = horizontal, blue = vertical  
**Inset:** Detail of a fault model  
**Above:** Finite element model applied to text

## Background

LaGriT is a software tool for generating, editing and optimizing multi-material structured and unstructured finite element grids. LaGriT maintains the geometric integrity of complex input volumes, surfaces, and geologic data and produces optimal grid elements (Delaunay triangles and tetrahedra, Voronoi polyhedra, octree hexahedral, structured, unstructured). The LaGriT grid generation system has many special features tailored to geological applications. The typical inputs to LaGriT geologic applications are geologic framework models from EarthVision, Stratimodel, or ESRI ArcInfo. LaGriT is also a set up tool and can aid in setting initial and boundary conditions of a physics model such as FEHM.

## Capabilities

- LaGriT projects include:
- Site characterization of Yucca Mountain, Nevada Test Site (NTS)
  - Flow and transport modeling at NTS underground test area
  - Meshing of California fault systems for Southern California Earthquake Center (SCEC)
  - Environmental restoration at Los Alamos and Savannah River labs
  - Oil and gas reservoir simulation
  - Semiconductor design and modeling
  - High speed hydrodynamic modeling of nuclear weapons
  - Enhanced oil recovery in tight shales

## Future Applications

- Carbon (CO<sub>2</sub>) capture and storage
- Thermomechanical models of a salt repository
- Geothermal and hydrothermal systems
- Ground water/surface water interaction
- Fluid flow in faults
- Mesh generation of MRI-derived data from respiratory systems

## Contact

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**Right:** Geologic model of the Pajarito Plateau within Los Alamos National Laboratory

